

## Claims:

1. A multicarrier communication system, comprising:  
a processor having channel delay spread knowledge that is used to adjust a guard interval of a packet prior to transmission.
2. The system of claim 1 wherein the guard interval is adjusted by appending a cyclic prefix to the packet that dynamically changes with updated channel delay spread knowledge.
3. The system of claim 1 wherein the guard interval is adjusted by appending a cyclic suffix to the packet that dynamically changes with updated channel delay spread knowledge.
4. The system of claim 1 wherein the guard interval is adjusted by appending both a cyclic prefix and a cyclic suffix to the packet that dynamically changes with updated channel delay spread knowledge.
5. The system of claim 1 wherein the multicarrier communication system is an Orthogonal Frequency-Division Multiplexing (OFDM) communication system.
6. The system of claim 1 wherein a target node determines the guard interval from a source transmission to set the guard interval.
7. The system of claim 1 wherein a source node determines the guard interval from a target transmission to set the guard interval.
8. The system of claim 1 wherein measured multipath reflections provide channel delay spread knowledge to set the guard interval and remove Inter-Symbol Interference (ISI).

9. The system of claim 1 wherein the multicarrier communication system is a Time Division Duplex (TDD) OFDM communication system that includes a source node to inform other nodes in the system of the guard interval that is to be commonly used.

10. The system of claim 1 wherein two nodes in the system set their respective guard intervals following a transmission from a source node to a target node and back again to the source node.

11. The system of claim 1 further including nodes associated with the source node to transmit information to inform the source node of their respective guard interval, and once received, the source node determines the appropriate guard interval and informs the nodes of the guard interval to be used.

12. The system of claim 1 wherein a target node informs a source node of the guard interval that is to be used and the source node then uses that guard interval for subsequent transmissions to the target node.

13. The system of claim 12, wherein a target node and a source node are programmed to revert back to a previous baseline guard interval that was negotiated with all nodes associated with the source node.

14. A communication system having Orthogonal Frequency-Division Multiplexing (OFDM) devices, a first OFDM device comprising:

an analog transceiver having a receiver chain to demodulate a packet;  
a processor coupled to the receiver chain to receive the packet and use channel delay spread knowledge to adjust a guard interval of a packet prior to transmission; and

a Static Random Access Memory (SRAM) memory coupled to the processor.

15. The communications system of claim 14 wherein the system dynamically monitors multipath reflections to provide channel delay spread knowledge to change the guard interval for further transmissions and remove Inter-Symbol Interference (ISI).

16. The communications system of claim 14 further including:  
other OFDM devices to transmit guard interval information to the first OFDM device where a guard interval is determined and transmitted to the other OFDM devices to provide the guard interval to be used.

17. A method comprising:

using multipath reflections to provide channel delay spread knowledge to change a guard interval for further transmissions in an Orthogonal Frequency-Division Multiplexing (OFDM) system and remove Inter-Symbol Interference (ISI), with recurrent channel delay spread knowledge updates to reveal dynamic channel variations.

18. The method of claim 17, further including:

transmitting the recurrent channel delay spread knowledge updates to inform other nodes in the system of the guard interval that is to be commonly used.

19. The method of claim 17, further including:

transmitting from a source node to a target node and from the target node to the source node to determine which of the two nodes has the channel delay spread knowledge to use to change the guard interval for both nodes.